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AUTHOR Sisson, Lee Hansen; And Others
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ABSTRACT

This paper describes the use of commercially-available software for the Apple Computer to augment diagnostic evaluations of learning disabled children and to enhance "learning to learn" strategies at the application/transfer level of learning. A short rationale discusses levels of evaluation and learning, using a model that synthesizes the ideas of Robert Gagne, Benjamin Bloom, Hilda Taba, and J. R. Gifford. Two case studies of children with learning disabilities describe a 7-year-old girl and an 11-year-old boy who were evaluated through computer programs to assess their learning difficulties and who were provided with learning experiences through computer assisted instruction. A listing of 59 educational software programs includes approximate price, producer/distributor with address, grade level(s), and brief comments for each. (LMM)

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Lee Hansen Sisson, Ph.D.
Shirley A. Mayfield, M.Ed.
Susan Entz, M.A.
Millard Owen Sheets, Jr., M.B.A.
Box 1838, Hilo, Hi. 96720
W.P.A. 1983

EVALUATING CHILDREN'S LEARNING DISABILITIES WITH AN APPLE II PERSONAL COMPUTOR
or
Tempting Poor Learners with an Apple

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Summary

Most traditional evaluation instruments focus upon fairly complex intellectual processes. In contrast, most "remediation" teaching occurs at the lower levels of learning. In this paper, the authors describe how they use commercially available software for the Apple Computor to augment diagnostic evaluations of children with learning disabilities. They also relate how they use such programs to enhance "learning to learn" strategies at the application/transfer level of learning.

The first section of the paper presents a short rationale on levels of evaluation and learning. It is followed by two case studies of children with learning problems. The final section is a listing of more than thirty programs the author's have acquired and used, in hopes that they will facilitate other adventurer's discovering the wonders of computorland.

How People Learn

One of the major contributions that educational psychologists have made is to focus attention on how people acquire information and change their behavior in response to this information. Among the many theorists who have offered their interpretations are Robert Gagne, Benjamin Bloom, Hilda Taba, and J.R. Gilford. The following model is a synthesis of ideas offered by these eminent theorists.

The lowest level of learning is termed Knowledge by Bloom. It subsumes most of Gagne's early categories involving conditioning and motor or verbal chaining of conditioned responses. Quite simply, it involves the ability to recognize or perceive and discriminate stimuli. The child can tell the difference between two pieces of information and pick out two that are the same.

A related and hierarchically more advanced task at the Knowledge level is the ability to recall or remember information. Again, this may be presented receptively, after an intervening period when the information is taken away, or expressively, when the child has to generate the information.

The second major level of learning involves Comprehension. Comprehension entails relating what is attended to with what one already has in one's head. The learner often translates the new information into her or his own words. It includes Gagne's category of Multiple Discrimination and is the lowest level of understanding or interpretation. The student comprehends the ma-

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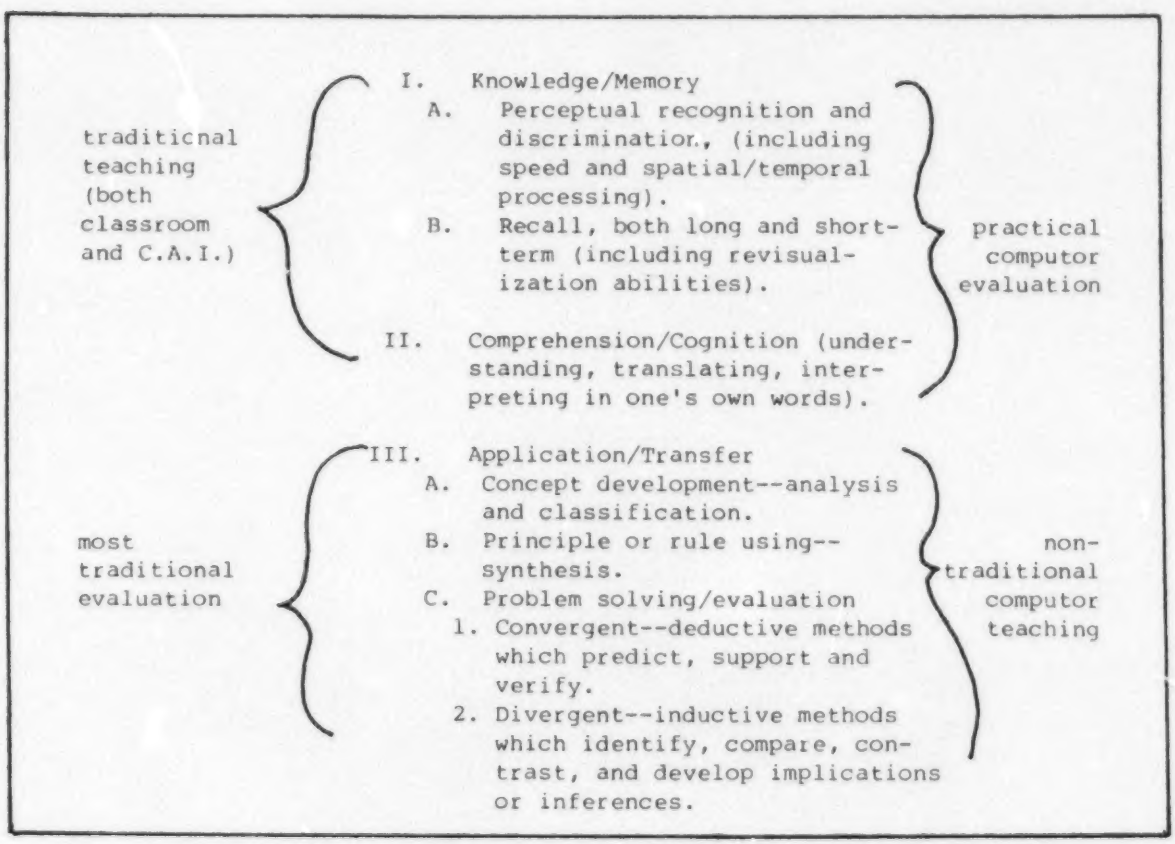
terial but does not yet apply it to new situations.

However, the abilities to perceive, remember and understand do not necessarily imply changes in behavior. It is only at the third and highest level of learning that the learner transfers the knowledge comprehended and applies it to new situations. Application subsumes a number of hierarchical abilities.

The first of these is Concept learning. The learner analyses various stimuli, abstracting their common properties, categorizing, labeling, and often organizing the material into a hierarchy.

After analysis, the material can be synthesized into new forms and the concepts organized into Principles with rules developed to use in new situations.

The final steps are Problem Solving and/or Evaluation: Both inductive and deductive reasoning become important. At the deductive or convergent level, the learner makes predictions, supports the predictions with evidence and verifies conclusions. The inductive/divergent process involves identifying the concepts or principles involved in a problem, comparing and contrasting them and developing inferences and implications for other situations.


traditicnal teaching (both classroom and C.A.I.)
I. Knowledge/Memory
A. Perceptual recognition and discriminatior., (including speed and spatial/temporal processing).
B. Recall, both long and short-term (including revisual-ization abilities).
II. Comprehension/Cognition (understanding, translating, interpreting in one's own words).
practical computor evaluation
most traditional evaluation
III. Application/Transfer
A. Concept development--analysis and classification.
B. Principle or rule using--synthesis.
C. Problem solving/evaluation
1. Convergent--deductive methods which predict, support and verify.
2. Divergent--inductive methods which identify, compare, contrast, and develop implications or inferences.
non-traditional computor teaching

Computor Evaluation and Teaching

Many of the problems that young children with learning difficulties evidence are at the first two levels of learning. Levels I and II encompass visual, auditory and tactile discrimination as well as memory, sequencing and comprehension. The input is through the eyes, ears, skin and muscles. The output, which is often distorted or missing, involves gesturing, moving speaking, reading and writing.

However, many of the diagnostic instruments tend to evaluate complex forms of learning, involving associational processes between several modalities. The teacher or psychologist who is trying to diagnose children with learning disabilities is faced with standardized clinical instruments which involve evaluating the child at these more advanced learning levels. According to Technical Report #11, by Marie and MacGinitie, from Columbia Teacher's College Research Institute for the Study of the Learning Disabled, the current, most common basis for classifying children as learning disabled is a discrepancy between scores on the WISC-R and a test of reading achievement.

The Wechsler scales are well respected and very useful, but few of the tasks evaluate only the knowledge level of a child's ability to learn: the exceptions are Digit Span (short term auditory memory) and Information which measures a child's general fund of knowledge but is strongly affected by environment; Coding involves visual memory but confounds it with visual motor and small muscle abilities.

Some standardized tests which are useful involve the Wepman (auditory discrimination), Bender Gestalt and Beery Test of Visual Motor Integration (visual discrimination and visual motor production) and the Frostig Tests. The ITPA is somewhat idiosyncratic and its listed categories do not always correspond to or delineate the concepts for which they are named.

Consequently, the evaluator must supplement standardized testing with clinical observations so that information relative to how a child learns, where the problems are occurring, and what needs to be done to circumvent them can be furnished to the teacher and parents. The first case study of this paper "Karla," focuses upon the use of canned programs for the Apple II computor and how they were utilized to gather information about Karla's learning processes. The clinical information will be presented in conjunction with the results of the numerous diagnostic tests which were also given.

The second case study "Joey," focuses upon the use of computor programs with an older child. Most remediational teaching in the traditional resource room is focused at the knowledge and comprehension levels of learning. Unfortunately, many of the children who spend months doing Frostig type tasks do not make the transfer to new situations. This is not to fault the simpler programs at the knowledge and comprehension levels, but it is merely to recognize that children must often be taught to transfer and assimilate "splinter" skills to use in facing new problems.

Even the majority of canned educational softwear in our "advanced" Computor Assisted Instruction programs tend to focus upon the two lower levels of learning. Useable learning involves the application level and

all the many sublevels which enable a learner to transfer information to new situations and develop problem solving modes.

Joey's disabilities are more subtle and his intelligence has permitted him to achieve an adequate reading and math level, although not in line with his potential. The authors emphasize teaching him learning skills within a computor game format. His need is to circumvent and learn coping strategies for those areas in which he shows weakness. Strengthening his self esteem through success experiences, increasing his motivation for learning and practice, and developing "learning to learn" strategies for future tasks are additional goals.

Karla

Karla, age 7, was brought to the author's attention by her mother and first grade teacher who were puzzled by the fact that although Karla gave the appearance of being a bright child, after a year of kindergarten, a year of first grade, in which she was retained, and three months into her second year of first grade, Karla still had almost no functional reading skills.

Karla presented herself to her evaluators as an attractive and friendly Hawaiian/Puerto Rican child with social and oral verbal skills appropriate for a seven year old. According to her mother, Karla had experienced seizures for several months after surgery for some sort of intestinal blockage in her fourth month of life. The seizures were brought under control with medication, and by age one year she was taken off the medication with no recurrence of the seizures. The only subsequent medical problem of any importance has been chronic skin rashes which are attributed to anxiety by the child's pediatrician.

The Wechsler Intelligence Scale for Children-Revised was administered to Karla over several sessions since she was seen after school and was somewhat tired. She achieved a verbal IQ score of 91 and a performance score of 108, with an overall IQ score of 99. According to the WISC, Karla's strengths lie in her ability to reason, both verbally and non-verbally. Her Similarities score was at the 63rd percentile and her Picture Arrangement score was at the 84th percentile. She also did well on the Mazes subtest, scoring at the 91st percentile. Her only really weak area was Information, which seemed to reflect a somewhat limited environment: she does not have older siblings nor did she attend preschool.

On the Beery Test of Visual-Motor Integration, Karla performed at age level. When asked to copy letters, both upper and lower case, she performed this task with no major errors, and no reversals. However, she could name very few of the letters, including "L", one of the letters in her name. She was unable to produce any letters dictated orally. She was able to print her name but left out the "R" and reversed the beginning letter, "K".

It was suspected at this point that Karla was experiencing a high level of anxiety. She kept suggesting that it might be time to go home: she was wiggly and squirmy and began to scratch first her leg, then her arm, then her head, and a rash was visible on her arm and one side of her face.

Karla was sent home with the suggestion that next time she would play some games up in the computor room. Since one of Karla's playmates is a former client, she was told that she would get to play Jennifer's favorite game.

Karla showed great interest and excitement about getting to play video games on the computor. By reducing her defensiveness and anxiety levels, the evaluator felt it would be possible to utilize a variety of computor software programs to detect exactly what it was Karla could not do, or had difficulty doing, that was keeping her from learning to read.

The receptive abilities were checked first, using the Reading Primer*2 portion of a program called Spelling Bee. Karla's motor responses were limited to moving the space bar which generated a check mark in the corner of the picture. With a lower level of anxiety, she was able to differentiate between initial consonant sounds and guess that "MONKEY" stood for the picture of the monkey rather than the bear or the turtle.

Her next task was to copy the word "MONKEY" when it was exposed for five seconds. (The Spelling Bee*3tutorial form of the program permits adjusting exposure time.) This proved to be impossible when the word was erased so the exposure time was increased and she was allowed to copy it on paper. She then referred to the paper to type it correctly onto the computor so she could be rewarded with a "happy face" and a tune.

When the evaluator switched to a Compu-Read* program in which the words had been programmed by the evaluators, Karla demonstrated another problem. She could copy the lower case word "monkey" but could not make the transfer to the upper case computor typewriter letters.

Karla was still having problems generalizing between capital letters and small letters as well as storing sequences in her visual memory. She had proved, however, she could discriminate letters and make some sound/symbol correspondences. It was not until some time later that she was able to expressively generate the word when she was presented only with the picture, in the Spelling Bee*drill.

With the other children, the authors have been able to evaluate the ability to re-sequence the letters correctly through a program which was entered in Magic Spells;*4 this has a game-type format and is very motivating to young learners who can generate their own words through language experience.

Still another level of evaluation has been permitted through the sentences portion of Compu-Read*. Sentences*5can be composed by student or teacher with blanks left for the nouns, objects and places. Lists of these are entered and then the computor randomly generates sentences and exposes them for the time chosen. Subsequently, the sertence is repeated with the word omitted*6 and the student must type in the word. Thus, the ability to assess meaning within context is examined.

* All starred programs are listed in the software section. The number refers to the particular picture on the display boards.

Use of a computor and modifiable software permits a unique situation for the examiner. Not only is the child relaxed and comfortable with a TV-type format, but the evaluator can focus upon observing, rather than also having to present the stimuli.

Other ways of evaluating thinking processes with number logic and ability to follow directions are discussed in the case study "Joey". With Karla, she began to practice and expand her skills using Spelling Bee*/Reading Primer and Compu-Read* programs that were individualized to meet her needs.

As she wearied of the over-learning that was necessary to integrate the many processes essential for reading, the authors introduced other computor programs.

A first favorite was Micro Painter*13/16 which allowed her to choose a picture and color it in. As she differentiated between BB (blue) LB (light blue) and DB (dark blue), she stored more reading-type information. Because her painting could be saved from time to time, it served as a reward for doing other more tedious exercises.

Nine months later, she has developed the skills to write simple stories with The Story Machine;*14/17 and create her own animated cartoons. She also has been forced to learn about grammatical structures and be careful about spelling words. The computor will not perform if the letters in the words which are typed do not match the words in its memory.

Rhymes and Riddles*15/18 is another current delight of Karla's. She is beginning to know enough simple words that she can often guess a nursery rhyme correctly and be rewarded with its tune. Karla will continue to need help for a long time but she is having successful, positive experiences with learning, and this is probably the single most important factor in helping a child with learning difficulties to succeed.

Joey

Joey, an attractive, mixed Japanese/Caucasian boy, was eleven when he was first referred to the authors. His school counselor said that both his teachers were concerned about him. They mentioned that Joey was very insecure about himself and his abilities. He made irrelevant statements and seemed lost in a fantasy world at times. His spelling was poor, he forgot things a lot, seemed disorganized and had trouble storing information in long term memory.

His mother, who was ethnically mixed herself, had Joey at 17 and moved frequently over the next few years. She was married to Joey's father, divorced because of his drug problems, and married again to a man who severely abused her, which Joey witnessed. After her divorce from him, life took an upturn for both of them. She married a kind, stable man, who showed Joey much affection; later, a little brother was born.

Joey moved five times before he started school, between Hawaii and the mainland. He then attended four schools before the fourth grade. Now,

with his life stabilized, it was time to help Joey realize his potential academically and socially.

When Joey was first seen, he appeared extremely anxious and very desirous of pleasing the author. The Wechsler Intelligence Scale for Children-Revised, was administered and his verbal and performance subtest scores were very similar, with an overall IQ of 112. However, his patterns in the verbal and performance areas were quite different; there was a range from the 15th to the 84th percentile on the verbal subtests and from the 50th to the 95th percentile on the performance tests.

He talked to himself at times, responding with a slight stammer when he was asked a direct question. He worked slowly and deliberately and his hands appeared to tremble when he did the coding subtest. His lowest score was in the Digit Span where he became very flustered at having to repeat back numbers. Another low score was in Arithmetic as well as a low-average Information score.

His strengths were in reasoning: Similarities, Comprehension and Picture Arrangement. Also strong were Vocabulary and Object Assembly; he said he enjoyed doing rubic cubes and jigsaw puzzles; reading was "so-so."

Another conference was held with the school counselor, who said that he had been referred for an evaluation as learning disabled several years previously, but that his achievement lag was never quite low enough to meet the criteria. She said that the teachers were concerned about the "odd way Joey thinks," interpreting things very literally. For example, when one of his teachers had said (wanting to send Joey on an errand) "Do you know where my car is?" He had answered very seriously, "Did you lose it?"

His most serious academic difficulties appeared to be in spelling and understanding math concepts. This was not surprising, since in interactions with Joey it was apparent he was excellent at reasoning, as long as he could impose his own order, but had difficulty with other's organization of material for him. His high level of anxiety interfered greatly with his abilities to memorize and perform in timed situations.

Joey was introduced to the computor through the MECC demonstration programs. He began to play Hurkle*[7] with the author, who modeled a mini-max strategy in guessing a number on a horizontal line.*[8] He was guided to discover that he could transfer the information to a vertical line and eventually became successful in applying the same type of strategy to a 10 by 10 grid.*[9]

Another program in the same series is Odell Lake.*[10, 11, 12] He struggled through the process, delighting in the graphics and learning, through experience, the importance of reading each instruction carefully. The author became aware of the extreme length of time it took Joey to automatize any mechanical/spatial processes. Finding the return button was a new experience each time he executed a program command.

Then Joey and the author advanced to computor adventure games. Their first experience was Wizard and Princess,*[19] at which they were both novices. This proved to be an advantage, since he was delighted to find he did some things better than a "professional." His unique way of looking at materials also permitted him to generate creative strategies.

When Snooper Troops I *20arrived at the office, Joey was ready. He took over like an old pro. For weeks, he struggled to control the keys which moved the car so he could avoid crashing and waiting for "repairs." He delegated the author to take notes and dictated the numbers to remember. Together, a map of the driving area was constructed and gradually he began to check off the subjects, making inferences about their guilt.

When Dark Crystal*21 arrived, the movie had just been shown and Joey was eager to try the strategies he had learned. Soon, he progressed to Time Machine*22with its mazes and even attempted The Prisoner,*22 enjoying particularly the hangman game.

Joey became so "hooked" on games that he was even willing to forego graphics for an all-text program, Microsoft Adventure.*24

With this computor-age form of "play therapy," Joey developed strategies for learning to learn. He classified ideas, synthesized new rules and used them to solve problems. He learned to predict possibilities which he could then verify through actual experience. He developed the implications of strategies on one program which he could then try with another.

Since many children with learning disorders develop rigid thinking processes, use of the computor games permitted exploring different consequences without the emotional consequences of "real" failure. (The computor does not pass judgement; a "save game" disc can always be employed if one strategy doesn't work.) Joey's prior knowledge was no longer a handicapping condition since his experiences were expanded vicariously and he had the freedom to explore different ways of thinking, using higher level associative and integrative processes.

Interestingly enough, Joey's small muscle coordination improved as he learned to monitor his kinesthetic feedback. Handwriting, too, improved. Probably most important of all, through his success experiences, his self-esteem increased and he began to relate more easily to his peers. With increased confidence, he became less anxious and defensive, and more open to others and their ideas.

Almost a year later, Joey's mother sent a copy of his current report card which had comments stating, "Joey has certainly come a long way and is feeling great about himself. He is starting to ask questions in math which is a promising sign." His Stanford Achievement Test stanines were in the average and high average range. The lowest scores were still in math and language concepts. However, the <u>real</u> surprise was a 90th percentile rank in Vocabulary and an 86th percentile rank in reading comprehension.

Software List

The following is a list of educational programs acquired over the past few years. Prices are approximate and addresses are given, since many programs must be obtained by mail when one lives in an insular community in the middle of the Pacific. Comments and classifications are the authors' own and other reviewers will obviously differ in their evaluations. It is, however, a starting point.

LEE HANSEN SISSON, Ph.D.
Hawaii State Certified Psychologist
Educational and Clinical Practice

APPLE PILOT $150.00
APPLE COMPUTER INC 10260 BANDLEY DRIVE
CUPERTINO CA 95014
USEFUL FOR DOING OWN EDUCATIONAL PROGRAMING; INCLUDES GRAPHICS ELEMENTS. NOT FOR THE NOVICE

BIRTH OF THE PHOENIX $22.00
PHOENIX SOFTWARE, INC. 64 LAKE ZURICH DR.
LAKE ZURICH IL 60047
A SHORT ALL-TEXT ADVENTURE GAME WITH CLUES. GOOD FOR BEGINNERS, UPPER ELEMENTARY AND UP.

BOP-A-BET $29.95 LOWE AND MAC CHESNEY
SIERRA ON-LINE SIERRA ON-LINE BLDG.
COARSEGOLD CA 93614
K-3RD. ALPHABET MAZE GAME. MOTIVATING BUT NEEDS GOOD PERCEPTUAL MOTOR ABILITY.

COMPU-MATH FRACTIONS $49.00
EDU-WARE SERVICES, INC 22222 SHERMAN WAY, SUITE 102
CANOGA PARK CA 91303
OKAY FOR UPPER ELEM/INTERMEDIATE. NOT VERY EXCITING.

COMPU-READ 3.0* $29.95
EDU-WARE SERVICES, INC P.O. BOX 22222
AGOURA CA 91301
V.USEFUL ALL LEVELS.'LETTERS' SECTION TOO CONFUSING.'SENTENCES' GREAT! EASY TO INDIVIDUALIZE.

COMPU-SPELL 29.95
EDU-WARE SERVICES, INC PO BOX 22222
AGOURA CA 91301
BEST FOR EVAL. OF READING/SPELLING LEVELS 4-8 GRADE. DULL PROG. DISCS AVAIL.FOR GRADE LEVELS.

COMPUTER SAT $75.00
HARCOURT BRACE JOVANOVICH 757 THIRD AVENUE
NEW YORK NY 10017
GOOD FOR HIGHSCH & ADULTS. HARD,TEDIOUS BUT USEFUL EXPLANATIONS. MORE MOTIVATING THAN BOOK.

COUNTING BEE $29.95 JOHN CONRAD
EDU-WARE SERVICES, INC. P.O. BOX 22222
AGOURA CA 91301
EXCELLENT PROGRAM FOR PRESCHOOL & EARLY ELEM. GOOD GRAPHICS & PIAGETIAN CONSERVATION TASKS.

CREATURE CREATOR $39.95
DESIGN WARE, INC. 185 BERRY ST.
SAN FRANCISCO CA 94107
AGE 4 UP. LIKE FACEMAKER, ONLY MONSTERS ARE ASSEMBLED & TAUGHT TO DANCE. INTRO. TO PROGRAMING.

CRYPTO CUBE $39.95
DESIGN WARE, INC. 185 BERRY ST.
SAN FRANCISCO CA 94107
GREAT CROSSWORD/SCRABBLE TYPE PROGRAM. AGE 8 UP. CAN ENTER OWN WORDS PLUS 50 CATEGORIES.

DECIMAL SKILLS $49.95 CONTEMPORARY PERSPECTIVES, INC.
MILTON BRADLEY CO 443 SHAKER ROAD
EAST LONGMEADOW MA 01028
GOOD GRAPHICS & EXPLANATIONS FOR UPPER ELEM, INTERMEDIATE & HIGH SCH. NEED TEACHER NEARBY.

DIVISION SKILLS $49.95 CONTEMPORARY PERSPECTIVES, INC.
MILTON BRADLY CO. 443 SHAKER ROAD
EAST LONGMEADOW MA 01028
SAME AS FOR 'DECIMAL SKILLS.'

DRAGON'S KEEP $29.95 LOWE AND MAC CHESNEY
SIERRA ON-LINE SIERRA ON-LINE BLGD.
COARSEGOLD CA 93614
ADVENTURE GAME W/ 2ND GRADE VOCABULARY. GOOD PREPARATION FOR OTHER ADVENTURES. A WINNER!

EAMON $4/DISC
COMPUTER LEARNING CENTER P.O. BOX 45202
TACOMA WA 98444
ADVENTURE GAMES W/OUT GRAPHICS. USED TO INCREASE READING.

HEY DIDDLE DIDDLE $29.95
SPINNAKER SOFTWARE CORP. 215 FIRST STREET
CAMBRIDGE MA 02142
USES UNFAMILIAR MUSIC. CHILDREN OLD ENOUGH TO READ & UNSCRAMBLE OFTEN DON'T LIKE NURSERY RHYMES

JENNY OF THE PRAIRIE $22.95
RHIANNON 3717 TITAN DR.
RICHMOND VA 23225
ELEM-JR. HIGH. ADVENTURE GAME FOR GIRLS. HIGH INTEREST LEVEL. 3 OTHER GAMES FOR GIRLS AVAIL.

KINDER COMP 29.95 DOUG DAVIS
SPINNAKER SOFTWARE CORP. 215 FIRST STREET
CAMBRIDGE MA 02142
V.GOOD PRESCHOOL PROGRAM. UPPER/LOWER CASE MATCHING. NUMBER SEQUENCES AND DRAWING.

LEARNING WITH LEEPER $29.95 NANCY ANDERTON
SIERRA ON-LINE SIERRA ON-LINE BLDG.
COARSEGOLD CA 93614
AGES 3-6. NEEDS JOY STICK. MATH, COLORS, SHAPES AND MAZES. GOOD EARLY LEARNING EXPERIENCE.

MAGIC SPELLS* $59.00 THE GRIMM'S (CHECK THE LEARNING CO)
ADVANCED LEARNING TECH. 4370 ALPINE ROAD
PORTOLA VALLEY CA 94025
BEST WHEN USED W/OWN LIST OF WORDS OR AS GAME. NOT BEGINNING TOOL: USED TO'OVER LEARN'MATERIAL

MASTER TYPE $39.95 BRUCE ZWEIG
LIGHTNING SOFTWARE P.O. BOX 11725
PALO ALTO CA 94306
A FUN ARCADE-TYPE INSTRUCTION GAME. NOT GOOD FOR THOSE W/HIGH ANXIETY LEVELS. INTER.-ADULT.

MECC DEMONSTRATION* $19.95
CREATIVE COMPUTING DEFT C925, 39 EAST HANOVER AVE
MORRIS PLAINS NJ 07950
WORTH MONEY FOR'HURKLE'(NUMBER STRATEGY) & ODELL LAKE. ALSO MUSIC READING. ELEM-INTERMEDIATE.

MICRO PAINTER* $34.95 BOB BISHOP
DATA SOFT INC. 16606 SCHOENBORN ST.
SEPULVEDA CA 91343
FUN FOR ANY AGE. JOYSTICKS NEEDED. PICTURES CAN BE SAVED. GOOD INTRO & PRACTICE HAND/EYE COORD

MICROBE $44.95 R.C. CLARDY & A.H. ZALTA, M.D.
SYNERGISTIC SOFTWARE 830 N. RIVERSIDE DRIVE, ST.201
RENTON WA 98055
V.DIFFICULT. JOYSTICK-TYPE GAME + MEDICAL KNOWLEDGE. EXPLORE BODY. V.MOTIVATING GIFTED HS/ADLT

MICROSOFT ADVENTURE* $25.00 GORDON LETWIN
MICROSOFT CONSUMER PROD. 400 108TH AVE N.E., SUITE 200
BELLEVUE WA 98004
FINE WAY TO 'SEDUCE' A LIMITED READER INTO PRACTICE. NO GRAPHICS; USE GRAPHICS ADVENTURE 1ST.

MIXED NUMBERS $49.95 CONTEMPORARY PERSPECTIVES, INC.
MILTON BRADLEY CO. 443 SHAKER ROAD
EAST LONGMEADOW MA 01028
HARD, BUT GOOD GRAPHICS. NEEDS TEACHER NEARBY. UPPER ELEM-> HIGH SCHOOL.

MOPTOWN $50.00 THE GRIMM'S (CHECK THE LEARNING CO)
ADVANCED LEARNING TECH. 4370 APINE ROAD
PORTOLA VALLEY CA 94025
VERY CONFUSING FOR MOST PRESCHOOL & EARLY ELEM. MIGHT BE OK FOR UPPER ELEM WITH COLOR MONITER.

MOST AMAZING THING $39.95
SPINNAKER SOFTWARE CORP. 215 FIRST ST.
CAMBRIDGE MA 02142
A WINNER. WORTHY SUCCESSOR TO SNOOPER TROOPS. TAKES PATIENCE & TEACHES PROBLEM SOLVING. 10 UP

OLYMPIC DECATHLON $29.95 TIMOTHY W. SMITH
MICROSOFT CONSUMER PROD. 400 108TH AVE N.E., SUITE 200
BELLEVUE WA 98004
HARD BUT WORTH IT. VERY CREATIVE HAND/EYE COORD. GOOD FOR HARD TO REACH H.S. & ARCADE'FREAKS'

PIRATE'S ADVENTURE $39.95 SCOTT ADAMS
ADVENTURE INTERNATIONAL P.O. BOX 3436
LONGWOOD FL 32750
GRAPHICS ADVENTURE. EASIER THAN STRANGE ODYSSEY. UPPER ELEM-ADULT.

PRISONER 2* $32.95 DAVID MULLICH
EDU-WARE SERVICES, INC. 22222 SHERMAN WAY
CANOGA PARK CA 91303
A FAVORITE-BUT PROBABLY FOR GIFTED H.S. & ABOVE UNLESS STUDENT WORKS WITH A MENTOR.

PUNCT.SKILLS:COMMAS $49.95 ROBERT CALDWELL & RICHARD CUMMINS
MILTON BRADLEY CO 443 SHAKER ROAD
EAST LONGMEADOW MA 01028
GOOD PRACTICE FOR INTERMEDIATE THROUGH ADULT. SOME RULES CONFUSING (AS ARE MOST COMMAS!)

PUNCT.SKILLS:END MKS $49.95 ROBERT CALDWELL & RICHARD CUMMINS
MILTON BRADLEY CO. 443 SHAKER ROAD
EAST LONGMEADOW MA 01028
MORE GOOD PRACTICE IN ENGLISH SKILLS. INTERMEDIATE-ADULT. POOR PUPIL NEEDS TEACHER NEARBY.

RHYMES & RIDDLES* $29.95 DR. AND MRS.(SIC) MARK CROSS
SPINNAKER SOFTWARE CORP. 215 FIRST STREET
CAMBRIDGE MA 02142
TOO HARD FOR PRESCHOOL BUT GREAT PRACTICE FOR ELEM. STUDENTS WHO LIKE HANG-MAN TYPE GAMES.

ROCKY'S BOOTS $49.95
THE LEARNING COMPANY 4370 ALPINE RD.
PORTOLA VALLEY CA 94025
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